THE CONTENTS OF THIS DOCUMENT ARE
THE HIGHEST QUALITY AVAILABLE

INITIAL BAC DATE 3/3/05

This Track 1 Decision Document is marked "Draft" but is a final document signed by the agencies.

_____ Date 2/15/2005

DOE/ID-10897
April 2002

SITE 045 TRACK 1 DECISION DOCUMENTATION PACKAGE, OU 10-08

DECISION DOCUMENTATION PACKAGE
COVER SHEET

Prepared in accordance with

TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT THE INEEL

Site Description: **Dirt Pile with Naval Smoke Cans Near INTEC**

Site ID: **045** **Operable Unit: 10-08**

Waste Area Group: 10

I. SUMMARY – Physical description of the site:

Site 045 consists of an earthen mound and several empty smoke pot canisters located one mile north of the Idaho Nuclear Technology Engineering Complex (INTEC) facility where the Big Lost River intersects with the railroad tracks.

This site was originally listed as part of an environmental baseline assessment in 1994 and identified as a potential new waste site in 1995. In accordance with Management Control Procedure-3448, *Reporting or Disturbance of Suspected Inactive Waste Sites*, a new site identification form was completed for this site. As part of the process, a field team wrote a site description, and collected photographs and global positioning system (GPS) coordinates of the site (the GPS coordinates are
The GPS coordinate system is listed as NAD 27, Idaho East Zone, State Plane Coordinates. The new site identification process also included a search and review of existing historical documentation.

Site investigations revealed several empty 5-gallon canisters labeled "Smoke, Pot, Floating, HC-M4A2" scattered at the base of the earthen mound. An interview with an INEEL explosives expert revealed that the smoke pots were used to create smoke screens during U.S. Naval training activities at the INEEL in the post-World War II era. The smoke pots formerly contained Type C hexachloroethane, zinc oxide, and grained aluminum. Metal compounds believed to have been formed in the HC smoke emission byproduct include zinc chloride, cadmium chloride, lead chloride, arsenic (chlorides and oxides) and aluminum oxide. The smoke pot canisters at Site 045 are empty and no residual material is evident on the ground surface. Site investigations and photographs show that vegetation surrounding the smoke pot canisters appears to be well established.

The origin of the earthen mound is not known. The environmental baseline assessment in 1994 reported that the mound resembled those proven to have been historical military ordnance caches. The mound contains a concrete flap evident towards the bottom (a possible indicator of a vault of some type). The mound is approximately15-20 ft in length, 10 ft wide and 8 ft high. There is no visual evidence of buried objects within the mound; vegetation on the mound is sparse.

DECISION RECOMMENDATION

II. SUMMARY - Qualitative Assessment of Risk:

The reliability of information provided in this report is medium to high. Site investigations and photographs reveal no visual evidence of hazardous substances or materials that may present a danger to human health and the environment, however, lacking field screening or sample data for this site, the overall qualitative risk is unknown. It has been determined by an INEEL explosives expert that the empty smoke pot canisters surrounding the earthen mound are unlikely to pose any significant risk to human health or the environment. The canisters were used to create smoke screens during training activities, most likely by U.S. Navy in the post WWII era. It is not known whether or not the smoke pots were discharged in this area or if the empty canisters were merely discarded there. Given the length of time since the canisters were discarded, organic constituents would have likely degraded due to weathering processes. It may be necessary to contact INEEL Cultural Resources personnel prior to removal or disturbance of these canisters because of the possibility that they might be considered an INEEL historical resource. To determine whether or not the mound is a concern it would be necessary to conduct further investigations, involving field screening, sampling, or dismantling the mound altogether.

III. SUMMARY - Consequences of Error:

False negative error:
The possibility of contamination levels at this site being above risk-based limits is remote; however, no field screening or sample data exist for this site to determine the associated risks.

False positive error:
If further action were completed at a low risk site site, funds expended could exceed the environmental benefit. Further investigation involving field screening and surface soil sampling and analysis for organic compounds, metals, radionuclides, or other hazardous constituents would be needed to confirm the presence or absence of a contaminant source. Based on interviews, field investigations, existing historical information, and lack of sample data, this site needs further investigation to be classified as No Further Action.

IV. SUMMARY - Other Decision Drivers:

There are no other decision drivers for this site.

Recommended Action:

It is recommended that this newly identified site continue under the Track 2 process to determine the extent and concentration of potential contamination that may be present. Interviews with INEEL personnel, past field investigations, and historical process knowledge indicate that risk to human health and the environment cannot be determined with existing information and a data gap exists.

Signatures: 9/23/04	**# Pages: 16**	**Date: June 6, 2001**
Prepared By: Marilyn Paarmann, WPI	**DOE WAG Manager:**	
Approved By: 9-30-04	**Independent Review:** 9-28-04	

DECISION STATEMENT (DOE RPM)	
Date Received: 1/14/05	
Disposition: A track 2 investigation will occur in 2005 for site 045. The results will be included in OU 10-08 determination. If appropriate soil cleanup will be coordinated with OU 3-13 Group 3 soil actions. Regulators will be informed of track 2 results and any removal.	
Date: 1/14/05	# Pages:
Name: Kathleen Hain	Signature: Kathleen S Hain

DECISION STATEMENT (EPA RPM)	Site-045
Date Received:	

Disposition:

EPA concurs that this site should proceed to a track 2 investigation.

Date: 9-23-04	# Pages:
Name: Dennis Faulk	Signature:

DECISION STATEMENT
(IDEQ RPM)

Date Received:

Disposition:

Site 045

Site 045 is an earthen mound and several empty smoke pot canisters located about 1 mile north of INTEC. The smoke pots apparently were used by the Navy for training exercises in the post World War II era. The smoke pots originally contained Type C hexachloroethane, zinc oxide, and aluminum. Metal compounds believed to be formed as byproducts include zinc chloride, cadmium chloride, lead chloride, arsenic (chlorides and oxides), and aluminum oxide. The smoke pots are empty and there is no visual evidence of residual material on the ground. Vegetation is well established.

The earthen mound is about 15 to 20 feet long by 10 feet wide and 8 feet high. There is a concrete flap near the bottom of the mound, which suggests the mound was used as a cache for military ordnance.

Additional information is needed to evaluate this site. The State recommends this site for further investigation under the Track 2 process.

Date: August 10, 2004	**# Pages:**
Name: Daryl F. Koch	**Signature:** Daryl F. Koch

Draft

PROCESS/WASTE WORKSHEET
SITE ID: 045

PROCESS: Dirt Pile With Naval Smoke Cans Near INTEC
WASTE: Earthen Mound and Discarded Empty Smoke Pot Canisters

Col 1 Processes Associated With This Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process
Disposal site containing an earthen mound and several smoke pot canisters, most likely discarded following post-WWII Naval training activities at the INEEL. The origin of the mound is unknown.	Site 045 includes empty 5-gallon smoke pot canisters labeled "Smoke, Pot, Floating HC-M4A2." These canisters most likely originated from Naval training activities at the INEEL. It is not known if the smoke pots were discharged in this area or merely discarded here. The origin of the mound is unknown; however, according to the 1994 Environmental Baseline Assessment, the mound resembles others that have proven to be historical military caches of ordnance.	**Artifact:** Earthen mound and several empty smoke pot canisters **Location:** The site is located one mile north of INTEC where the Big Lost River intersects with the railroad tracks. **Description:** Site 045 consists of an earthen mound approximately 15-20 ft in length, 10 ft wide, and 8 ft high with a concrete flap evident towards the bottom. Vegetation is sparse on the mound. Several empty 5-gallon canisters labeled "Smoke, Pot, Floating HC-M4A2" were discarded at the base of the mound. The canisters contain no residual material. The ground surface has no discoloration or stains. Vegetation is healthy and well established surrounding the earthen mound.

Draft

CONTAMINANT WORKSHEET

SITE ID: 045
PROCESS: (Col 1) Dirt Pile with Naval Smoke Cans Near INTEC
WASTE: (Col 2) Mound and Smoke Pot Canisters

Col 4 What Known/Potential Hazardous Substance/Constituents are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 Known/Estimated Concentration of Hazardous Substances/ Constituents	Col 7 Risk-based Concentration	Col 8 Qualitative Risk Assessment (hi/med/low)	Col 9 Overall Reliability (high/med/low)
Unknown	Soil	Unknown	Unknown	Med-Low	Med-Low

Question 1. What are the waste generation processes, locations, and dates of operation associated with this site?

Block 1 Answer:

Site 045 consists of an earthen mound and several empty 5-gallon smoke pot canisters located approximately one mile north of INTEC where the Big Lost River intersects with the railroad tracks. The smoke pots likely originated from post-WWII era Naval training activities at the INEEL. It is not known if the smoke pots were discharged in this area or if the canisters were merely discarded here.

The origin of the mound is unknown; however, according to the 1994 Environmental Baseline Assessment, the mound resembles others that have proven to be historical military caches of ordnance.

Block 2 How reliable are the information sources? X High _Med _Low (check one)
Explain the reasoning behind this evaluation.

Interviews were conducted with an INEEL Environmental Baseline Assessment Team Member, Cultural Resource Personnel, and an INEEL explosives expert who either visited the site or reviewed photographs verifying the physical description of the site.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)
If so, describe the confirmation.

This information was confirmed with interviews, site investigations, and photographs of the site.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]		**Analytical data**	[ ]	
Anecdotal	[X]	2,6,7	**Documentation about data**	[ ]	
Historical process data	[ ]		**Disposal data**	[ ]	
Current process data	[ ]		**Q.A. data**	[ ]	
Photographs	[X]	3	**Safety analysis report**	[ ]	
Engineering/site drawings	[ ]		**D&D report**	[ ]	
Unusual Occurrence Report	[ ]		**Initial assessment**	[X]	5
Summary documents	[X]	4	**Well data**	[ ]	
Facility SOPs	[ ]		**Construction data**	[ ]	
OTHER	[ ]				

Question 2. What are the disposal processes, locations, and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

Site 045 consists of an earthen mound and several empty 5-gallon smoke pot canisters located approximately one mile north of INTEC where the Big Lost River intersects with the railroad tracks. An interview with an INEEL explosive expert revealed that the smoke pots resulted from post-World War II era Naval activities at the INEEL and were likely discarded in the late 1940s or early 1950s. The smoke pots were used to create smoke screens during training exercises; the canisters are weathered and appear to have been empty for a long period.

The origin of the earthen mound is not known. The environmental baseline assessment in 1994 suggested that the mound resembled those proven to have been historical military ordnance caches. The mound has a concrete flap evident towards the bottom (a possible indicator of a vault of some type).

Block 2 How reliable are the information sources? X High _Med _Low (check one)
Explain the reasoning behind this evaluation.

Interviews were conducted with an INEEL Environmental Baseline Assessment Team Member, Cultural Resource Personnel, and an INEEL explosives expert who either visited the site or reviewed photographs verifying the physical description of the site and artifacts.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)
If so, describe the confirmation.

This information was confirmed with interviews, site investigations, and photographs of the site.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]		**Analytical data**	[ ]	
Anecdotal	[X]	2,6,7	**Documentation about data**	[ ]	
Historical process data	[ ]		**Disposal data**	[ ]	
Current process data	[ ]		**Q.A. data**	[ ]	
Photographs	[X]	3	**Safety analysis report**	[ ]	
Engineering/site drawings	[ ]		**D&D report**	[ ]	
Unusual Occurrence Report	[ ]		**Initial assessment**	[X]	5
Summary documents	[X]	4	**Well data**	[ ]	
Facility SOPs	[ ]		**Construction data**	[ ]	
OTHER	[ ]				

Question 3. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

There is limited evidence that a source exists at Site 045. Site investigations and interviews revealed that the smoke pot canisters contained no residual material and are unlikely to pose any significant risk. The soil area surrounding the canisters showed no evidence of stained soil and the vegetation appeared to be well established.

It was reported in the 1994 Environmental Baseline Assessment that the earthen mound resembled those proven to have been historical military ordnance caches. The mound has a concrete flap evident towards the bottom, possibly indicating a vault of some type. Vegetation on the mound is sparse. Information is insufficient to confirm that a source is present or absent within the mound.

Block 2 How reliable are the information sources? __ High X Med _Low (check one)
Explain the reasoning behind this evaluation.

Discussions were held with an INEEL explosives expert who visited the site and was familiar with past practices. He confirmed that the smoke pot canisters were empty. He had no information about the mound and suggested it be investigated further to rule out the possibility of buried ordnance.

Block 3 Has this information been confirmed? __ Yes X No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]	**Analytical data**	[ ]
Anecdotal	[X] 6	**Documentation about data**	[ ]
Historical process data	[ ]	**Disposal data**	[ ]
Current process data	[ ]	**Q.A. data**	[ ]
Photographs	[ ]	**Safety analysis report**	[ ]
Engineering/site drawings	[ ]	**D&D report**	[ ]
Unusual Occurrence Report	[ ]	**Initial assessment**	[X] 5
Summary documents	[X] 4	**Well data**	[ ]
Facility SOPs	[ ]	**Construction data**	[ ]
OTHER	[ ]		

Question 4. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

Migration of potential contaminants cannot yet be determined with existing information, but site investigations reveal that the smoke pot canisters contain no residual material. There is no evidence of stained or discolored soil areas and although vegetation is sparse on the earthen mound, surrounding vegetation appears to be well established. However, no field screening or sampling has been conducted at this site for organics, metals, radionuclides or other hazardous constituents to confirm the existence of a hazardous source.

Block 2 How reliable are the information sources? _ High X Med _Low (check one)
Explain the reasoning behind this evaluation.

Site inspections and photographs show no visual evidence of stained soil and vegetation surrounding the canisters appears to be well established. Further investigation involving field screening or sampling would be required to confirm presence or absence of contaminant migration.

Block 3 Has this information been confirmed? _ Yes X No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]	Analytical data	[ ]
Anecdotal	[ ]	Documentation about data	[ ]
Historical process data	[ ]	Disposal data	[ ]
Current process data	[ ]	Q.A. data	[ ]
Photographs	[X] 3	Safety analysis report	[ ]
Engineering/site drawings	[ ]	D&D report	[ ]
Unusual Occurrence Report	[ ]	Initial assessment	[X] 5
Summary documents	[ ]	Well data	[ ]
Facility SOPs	[ ]	Construction data	[ ]
OTHER	[ ]		

Question 5. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

The smoke pot canisters are weathered and appear to have been empty for a long period. There is no visual evidence of residual material and the soil beneath the canisters shows no evidence of discoloration or staining and vegetation appears to be well established. The HC smoke emission byproducts were reportedly released 50-60 years ago; therefore, the potential risk of these contaminants being present at levels above risk-based limits is quite remote.

The pattern of potential contamination for the earthen mound cannot be estimated with existing information. It has been suggested that the mound resembles those proven to have been historical military ordnance caches located west of the Experimental Field Station and North of INTEC. Further field screening and/or sampling would be required to determine the potential for contamination in the mound.

Block 2 How reliable are the information sources? _High X Med _Low (check one) Explain the reasoning behind this evaluation.

This estimate was derived from the information contained in the environmental baseline assessment, subsequent site investigations, interviews with personnel familiar with INEEL historical processes, and photographs of the site.

Block 3 Has this information been confirmed? __ Yes X_No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]	**Analytical data**	[ ]
Anecdotal	[X] 6	**Documentation about data**	[ ]
Historical process data	[ ]	**Disposal data**	[ ]
Current process data	[ ]	**Q.A. data**	[ ]
Photographs	[X] 3	**Safety analysis report**	[ ]
Engineering/site drawings	[ ]	**D&D report**	[ ]
Unusual Occurrence Report	[ ]	**Initial assessment**	[X] 5
Summary documents	[X] 4	**Well data**	[ ]
Facility SOPs	[ ]	**Construction data**	[ ]
OTHER	[X] 8		

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

The estimated contaminated region or source volume for this site cannot be estimated with existing information. Potential risk resulting from the smoke pot canisters is quite unlikely because the canisters are empty, the soil area is not discolored or stained, and vegetation beneath the canisters is well established.

The earthen mound is approximately 15-20 ft in length, 10-12 ft wide, and 8-10 ft high. It has been suggested that the mound resembles those proven to have been historical military ordnance caches. Further site investigation involving field screening or sampling would be required to determine the potential source volume for the mound.

Block 2 How reliable are the information sources? _High X Med _Low (check one)
Explain the reasoning behind this evaluation.

The estimated size of the mound was derived from information contained in the environmental baseline assessment, subsequent site investigations, and photographs of the site. The estimated source volume cannot be estimated without further field screening and/or sampling.

Block 3 Has this INFORMATION been confirmed? _Yes X No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]	Analytical data	[ ]
Anecdotal	[ ]	Documentation about data	[ ]
Historical process data	[ ]	Disposal data	[ ]
Current process data	[ ]	Q.A. data	[ ]
Photographs	[X] 3	Safety analysis report	[ ]
Engineering/site drawings	[ ]	D&D report	[ ]
Unusual Occurrence Report	[ ]	Initial assessment	[X] 5
Summary documents	[X] 4	Well data	[ ]
Facility SOPs	[ ]	Construction data	[ ]
OTHER	[ ]		

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

The smoke pot canisters contain no residual material and therefore, are unlikely to pose any significant risk. There is no evidence of stained or discolored soil, and vegetation appears to be well established. Given the length of time since the canisters were discarded, organic constituents would have likely degraded due to weathering processes.

The estimated quantity of hazardous constituents for the earthen mound cannot be estimated without further site investigation involving field screening and/or sampling.

Block 2 How reliable are the information sources? _High X Med _Low (check one)
Explain the reasoning behind this evaluation.

Based on site investigations and an interview with an explosives expert, it is unlikely that contamination from the smoke pots would be present at levels above acceptable risk-based limits. Other hazardous constituents cannot be confirmed with existing information.

Block 3 Has this INFORMATION been confirmed? _Yes X No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]	Analytical data	[ ]
Anecdotal	[ ]	Documentation about data	[ ]
Historical process data	[X] 6	Disposal data	[ ]
Current process data	[ ]	Q.A. data	[ ]
Photographs	[X] 3	Safety analysis report	[ ]
Engineering/site drawings	[ ]	D&D report	[ ]
Unusual Occurrence Report	[ ]	Initial assessment	[X] 5
Summary documents	[X] 4	Well data	[ ]
Facility SOPs	[ ]	Construction data	[ ]
OTHER	[X] 8		

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Although no field screening or sampling information exists for the smoke pot canisters, it is unlikely they pose any significant risk. The canisters contain no visible residual material and were likely discarded approximately 50-60 years ago. Vegetation surrounding the canisters appears to be well established and there is no evidence of soil discoloration or staining.

There is insufficient information about the earthen mound to determine whether hazardous constituents are present. Based on this data gap, further site investigation should be conducted to determine whether the mound poses a potential risk.

Block 2 How reliable are the information sources? _High X Med _Low (check one)
Explain the reasoning behind this evaluation.

This evaluation is based on site investigations, historical process information, and photographs of the site.

Block 3 Has this INFORMATION been confirmed? __Yes _X No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	[ ]		**Analytical data**	[ ]	
Anecdotal	[ ]		**Documentation about data**	[ ]	
Historical process data	[ ]		**Disposal data**	[ ]	
Current process data	[ ]		**Q.A. data**	[ ]	
Photographs	[X]	3	**Safety analysis report**	[ ]	
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Unusual Occurrence Report	[ ]		**Initial assessment**	[X]	5
Summary documents	[X]	4	**Well data**	[ ]	
Facility SOPs	[ ]		**Construction data**	[ ]	
OTHER	[X]	8			

REFERENCES

1. DOE, 1992, Track 1 Sites: Guidance for Assessing Low Probability Sites at the INEL, DOE/ID-10390 (92), Revision 1, U.S. Department of Energy, Idaho Falls, Idaho, July.

2. Interview with Scott Lebow, Environmental Baseline Assessment team member, February 7, 2001.

3. Photographs of Site #045: P94-948-4-8A, P94-948-4-9A and P94-948-4-10A.

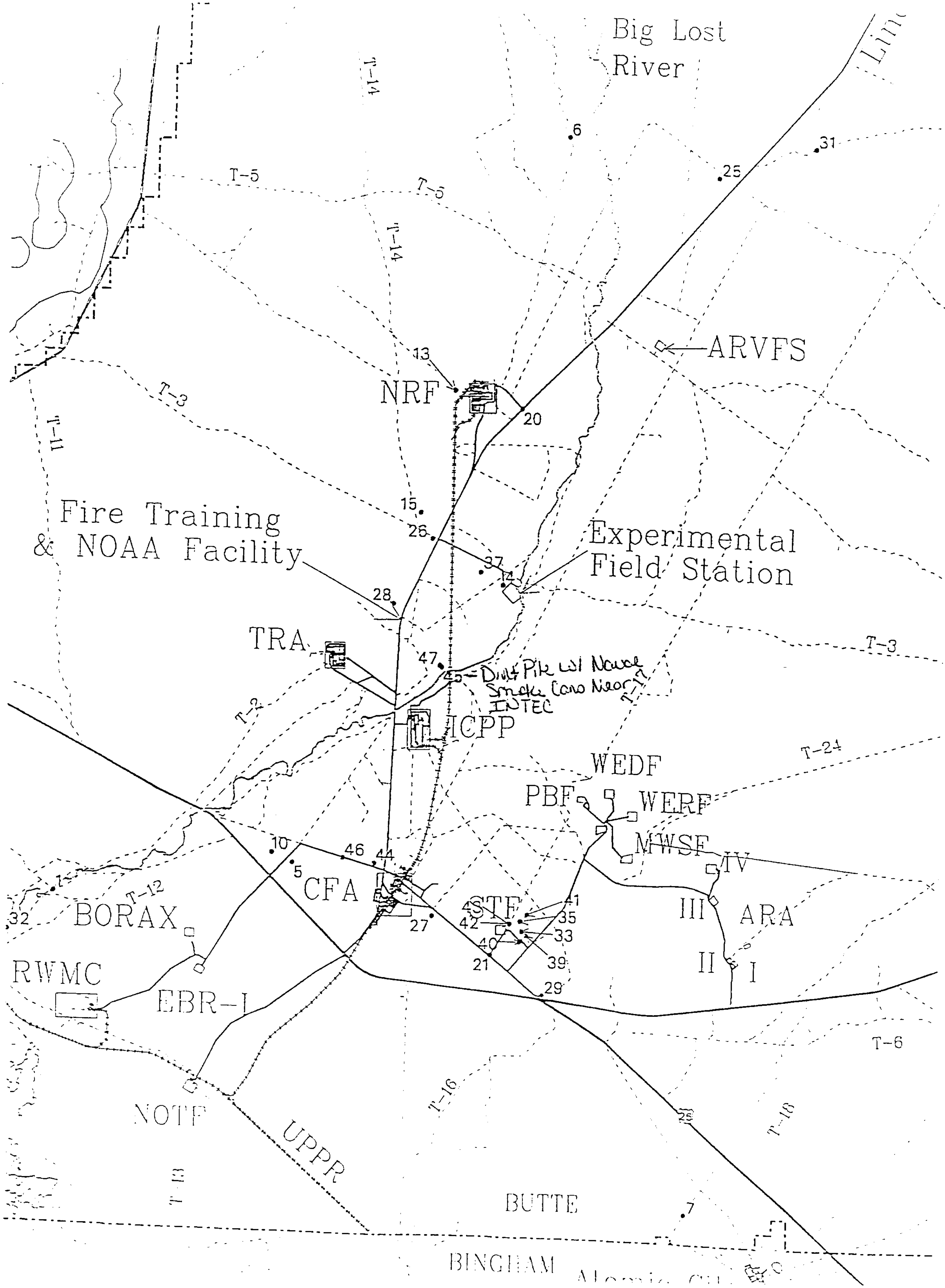
4. EG&G Idaho, Inc. 1994, Environmental Baseline Assessment, Volume I: Site Facilities (DRAFT), EGG-WM-11469, September.

5. FY1999 WAG 10 Newly Identified Sites, Volumes I and II.

6. Interview with Hanceford Clayton, INEEL ER ESH&QA Explosives Expert, April 11, 2001.

7. Interview with Brenda Ringe Pace, INEEL Cultural Resources Management, March 2001.

8. Health Risk Assessment of Hexachloroethane Smoke from HC-M4A2 Floating Smoke Pots, Chemical and Biological Defense Information Analyst's Center, April 23, 2001.


Big Lost River
T-14
6
31
25
T-5
T-5
T-14
ARVFS
13
NRF
20
T-3
T-11
15
Fire Training & NOAA Facility
26
Experimental Field Station
37
14
28
TRA
T-3
47
45 = Drill Pit w/ Naval Smoke Cans Near INTEC
T-2
ICPP
T-24
WEDF
PBF
WERF
10
46
44
MWSF
IV
5
CFA
T-12
BORAX
32
43
STF
41
35
42
33
40
27
III
ARA
21
39
II
I
RWMC
29
EBR-I
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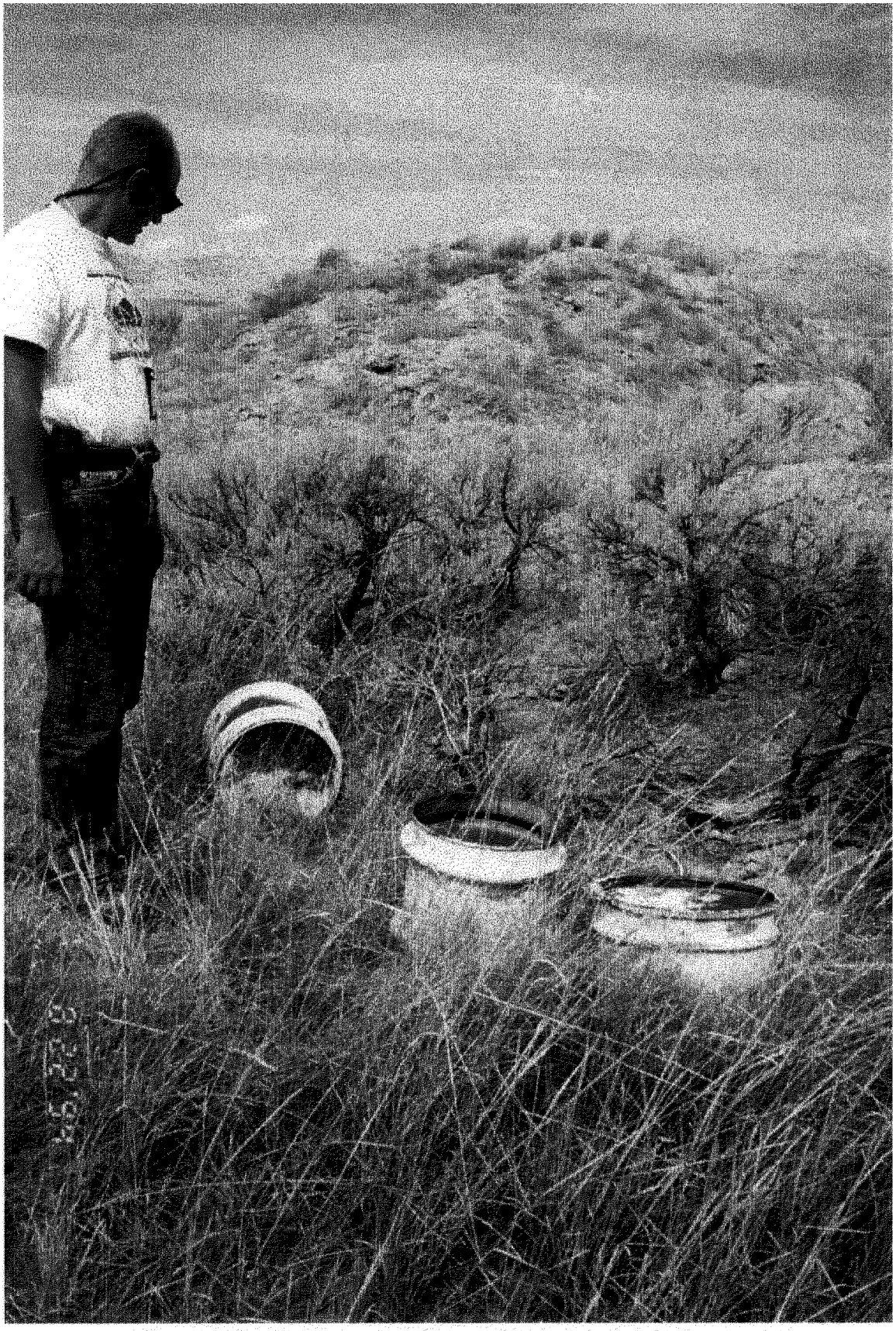
T-16
UPPR
T-18
BUTTE
7
BINGHAM

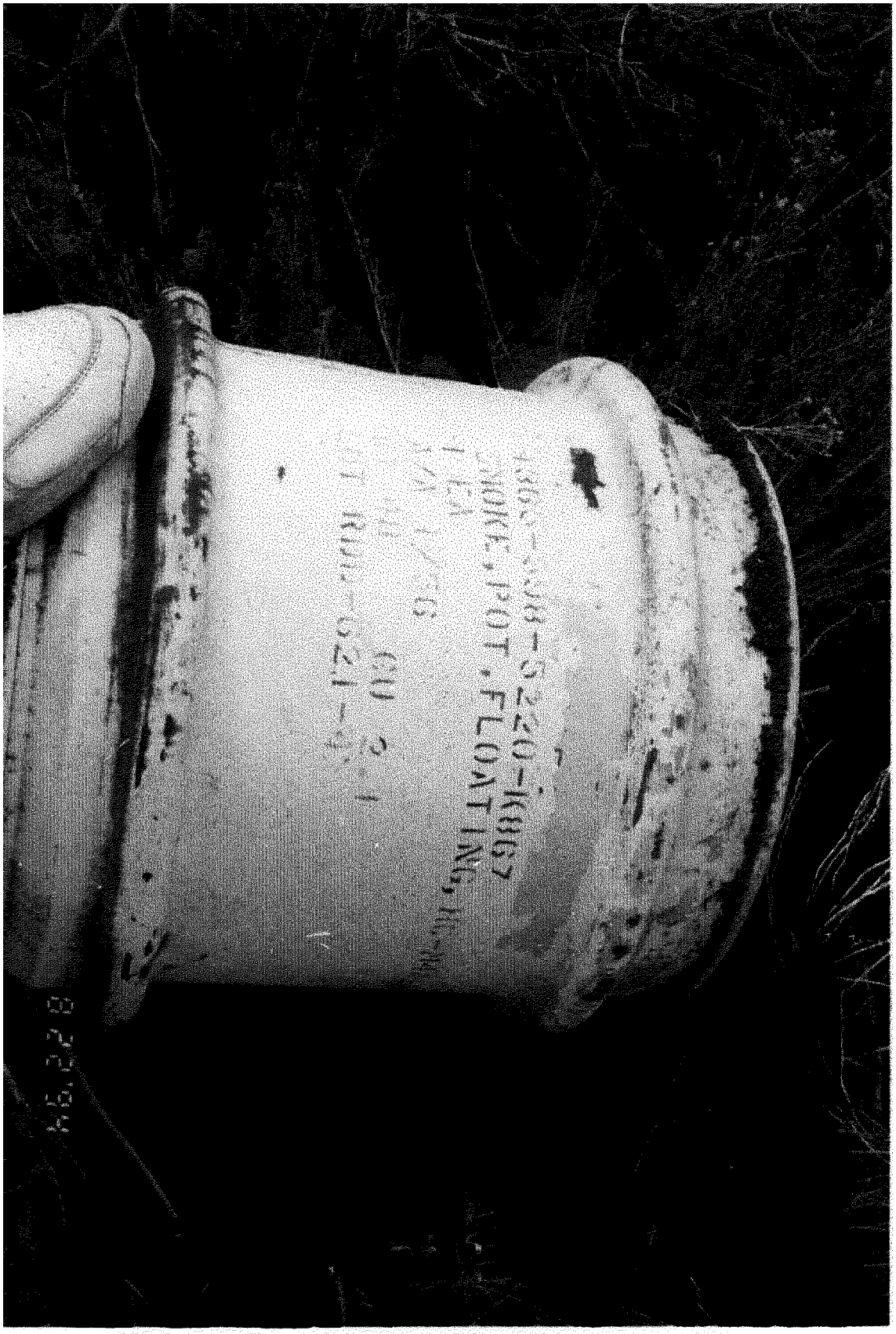
Draft

Attachment A

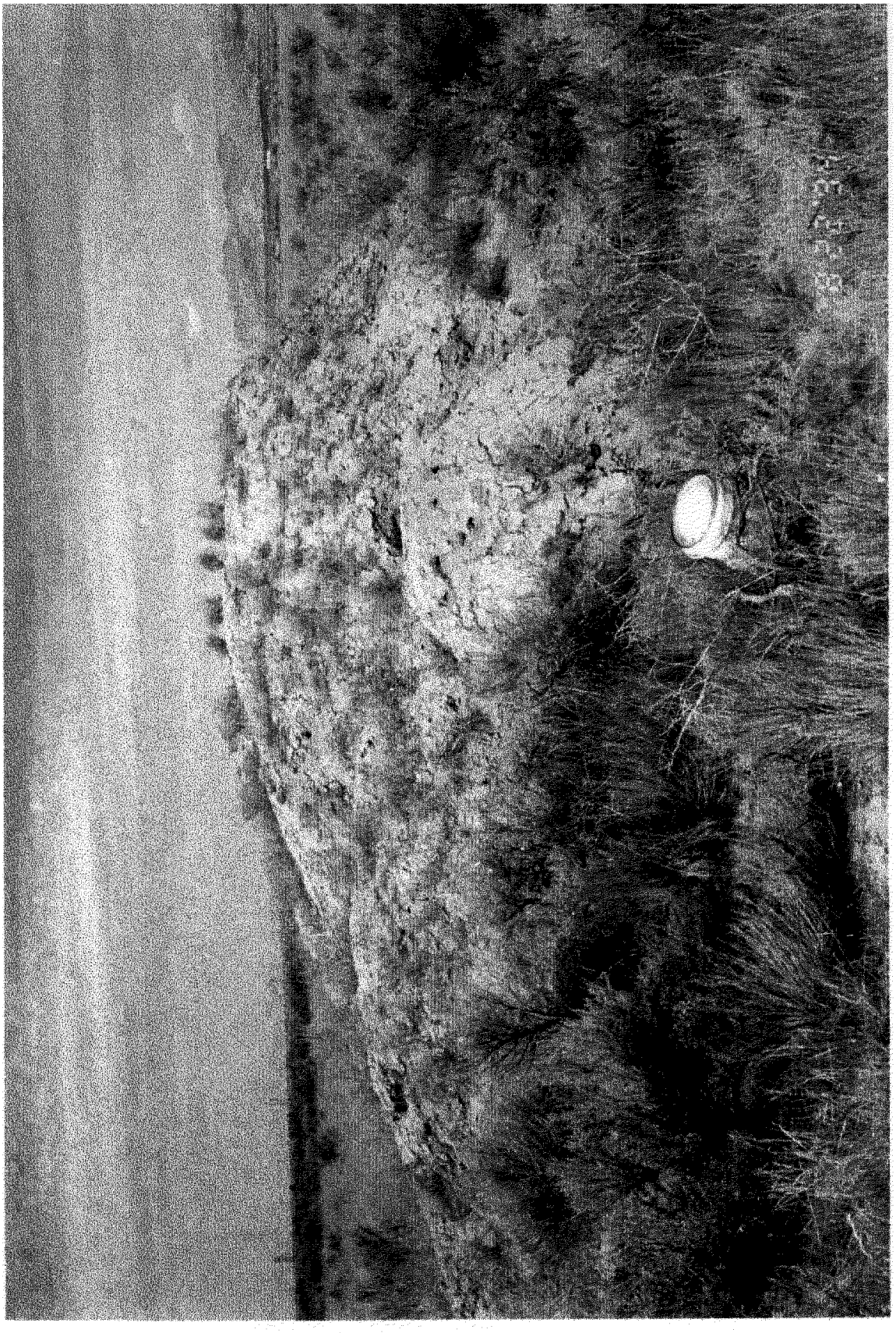
Photographs of Site #045



Site: 045 Dirt Pile with Naval Smoke Cans Near INTEC
(94-948-4-9A)



Site: 045 Dirt Pile with Naval Smoke Cans Near INTEC
(94-948-4-8A)



Site: 045 Dirt Pile with Naval Smoke Cans Near INTEC
(94-948-4-09A)

Draft

Attachment B

Supporting Information for Site #045

~~435.36~~
04/14/99
Rev. 03

NEW SITE IDENTIFICATION

Part A – To Be Completed By Observer

1. Person Initiating Report: Jacob Harris	Phone: 526-1877
Contractor WAG Manager: Douglas Burns	Phone: 526-4324

2. Site Title: 045, Dirt Pile with Naval Smoke Cans Near INTEC

3. Describe the conditions that indicate a possible inactive or unreported waste site. Include location and description of suspicious condition, amount or extent of condition and date observed. A location map and/or diagram identifying the site against controlled survey points or global positioning system descriptors shall be included to help with the site visit. Include any known common names or location descriptors for the waste site.

A dirt pile and debris are located north of INTEC where the Big Lost River intersects with the railroad tracks. During the July 1999 site visit the observed surface debris included several cans marked with "Smoke, Pot, Floating". The cans are near a dirt pile. The GPS coordinates of the site are . The reference number for this site is 045 and can be found on the summary map as provided.

Part B – To Be Completed By Contractor WAG Manager

4. Recommendation:

☒ This site meets the requirements for an inactive waste site, requires investigation, and should be included in the INEEL FFA/CO Action Plan. Proposed Operable Unit assignment is recommended to be included in the FFA/CO.
WAG: Operable Unit:

☐ This site DOES NOT meet the requirements for an inactive waste site, DOES NOT require investigation and SHOULD NOT be included in the INEEL FFA/CO Action Plan.

5. Basis for the recommendation:

The conditions that exist at this site indicate the potential for an inactive waste site according to Section 2 of MCP-3448 Reporting or Disturbance of Suspected Inactive Waste Sites.

The basis for recommendation must include: (1) source description; (2) exposure pathways; (3) potential contaminants of concern; and (4) descriptions of interfaces with other programs, as applicable (e.g., D&D, Facility Operations, etc.)

6. Contractor WAG Manager Certification: I have examined the proposed site and the information submitted in this document and believe the information to be true, accurate, and complete. My recommendation is indicated in Section 4 above.

Name: _____ Signature: _____ Date: _____

- T2N, R32E, Sec. 23 - A large area of Canadian Thistle (a noxious weed) located on one of the lesser developed dirt tracks southwest of East Butte; however, no potentially significant environmental conditions associated with this site were noted.

- T3N, T4N, and T5N, R29E and R30E - This area of the INEL was severely burned by a range fire on July 1, 1994. As indicated by Photograph 39, very little vegetation survived above the ground surface. Follow-up studies report that subsurface plant life and seeds are thriving as would be normal for this type of occurrence. No potentially significant environmental conditions associated with this site were noted. (Reference photograph 39)

- T3N, R28E, Sec. 15 - A 1-gallon container containing approximately one quart of some type of petroleum product located on Highway 20/26 east of the rest area on a dirt road approximately 100 yards from the "Do Not Pass" and the a "Rest Area Ahead" signs.

- T3N, R29E, Sec. 1 and 12 - Ordnance-related material (potentially land mine items) dumped in three separate sites along the east bank of the large, old canal running between TRA and NRF. Also seen at this site was evidence of burning (scorched vegetation and soil).

- T3N, R29E, Sec. 7 - Burned area located east of the Fire Training Facility's newest building. Interviews indicate that this is the remains of an old wooden structure, hauled to the area approximately 15-20 years ago, and burned for practice by the Fire Department. No potentially significant environmental conditions associated with this site were noted.

- T3N, R29E, Sec. 13 - Evidence of buried and burned material located in the old northeast canal east of the TRA fence line and north east of the TRA-732 Decontamination Pad. EBS assessors identified buried concrete, what appears to be an old bucket or small drum, and potential asbestos along with the burned materials. (Reference Photographs 11, 12, 13, and 14)

- T3N, R29E, Sec. 34 - Reinforced concrete blocks, used at the Rifle Range for a back barrier, and previously used by the Navy in CFA. Interviews indicate that the Navy shot shells into these blocks, and that there may be lithium mixed in with some of these concrete blocks. This assumption was made after other blocks moved from the same location in CFA to the Naval Ordnance Testing Facility (NOTF) were tested and found to have lithium.

Add AS Dirt Pile near INTEC

- T3N, R30E, Sec. 5, 6, 8, and 18 - Several mounds of dirt that resemble those proven to have been historical military caches of ordnance located west of Experimental Field Station and north of ICPP. These mounds range from approximately 2 to 10 yards. One of the mounds located in Section 18 was found to have a concrete flap evident toward the bottom (a possible indicator of a vault of some type). Several empty containers labeled "Smoke, Pot, Floating..." were found around another mound in Section 18. (Reference Photograph 31)

- T3N, R30E, Section 7 - A small pile (approximately 4 by 2.5 ft) of what was reported to be terphenyls and possible TNT was located immediately east of the asphalt at the Fire Training Facility. Interviews also indicate that sampling results of this material in September 1989 indicated terphenyls, which have been identified as co-carcinogens. (Reference Photograph 27)

Marilyn Paarmann
Interview with Hans Clayton
INEEL Explosives Expert
April 11, 01

Hans reviewed photographs
of site 26, 35, 45

Site 045

Smoke pots - used to contain HC
now empty - pose no risk now
used for Navy activities at INEEL
post WWII - smoke screen demos
pits - former detonation pits from
1940's

mound - push up - could be
ordnance burial - need to
knock down - carefully out
to see what's there.

(8)

A REVISED HEALTH RISK ASSESSMENT OF THE USE OF HEXACHLOROETHANE SMOKE ON AN ARMY TRAINING AREA

1 INTRODUCTION

This report supersedes U.S. Army Construction Engineering Research Laboratory (USA-CERL) Technical Report N-164.[1]

Historical Background

Type C hexachloroethane (HC) smoke mixes containing grained aluminum, hexachloroethane, and zinc oxide have been loaded in grenades, artillery shells, rockets, bombs, and smoke pots since the early 1930s. All of these munitions were used during World War II, but by far the most widely used HC munition was the smoke pot.[2] At the time of Pearl Harbor, the Chemical Warfare Service (CWS) standard smoke pot (M1) was a cylindrical can, 8 in. high and 5 in. in diameter, holding about 10 lb of HC type C mixture. Fired by hand or electric current, the M1 released a cloud of grayish-white smoke for a period of 5 to 8 minutes. The CWS had developed this pot in the early 1930s as a munition for training exercises, but when the war began, it was the only munition of its type available; the U.S. Army used it in North Africa. Because they release smoke within seconds after ignition, these pots were useful in setting up a preliminary screen during the 5 or so minutes it took large mechanical generators to warm up and start functioning. They helped shield harbors and installations on the coast of North Africa as well as the harbors at Palermo and Licata in Sicily.

In 1944, the CWS began to manufacture pots holding three times as much HC which could burn twice as long. Almost a million large pots designated as model M5 came from filling lines before the end of the Second World War. However, they did not reach Europe in appreciable quantities before VE Day and the original M1, of which more than five million were produced, remained the workhorse of the ground troops.

Although HC, like the other CWS screening agents, was regarded as nontoxic, as early as 1944 its use in troop training exercises showed that when inhaled in a confined area, it could produce fatalities through extreme lung irritation. The airborne particles of zinc chloride dispersed during the burning of HC were believed to be the only toxic elements until further tests revealed that HC mixtures contaminated with ammonium chloride were even more

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[1] E. W. Novak, L. C. Lave, J. J. Sickel, and S. Miller, A Health Risk Assessment of the Use of Hexachloroethane Smoke on an Army Training Area, Technical Report N-164/AD80/9544 (United States Army Construction Engineering Research Laboratory, December 1981).

[2] L. Brophy, W. Miles, and R. Cochrane, "Smoke," In U.S. Army in World War II--The Chemical Warfare Service from Lab to Field (Department of the Army, 1959), pp 200-204.

lethal.[3] Currently, the acute toxic effects of type C HC smoke are better understood. These effects include edema and possible hemorrhage, resulting primarily from the high concentrations of zinc chloride in the lungs ($ZnCl_2$) and the high proportion (≤ 3%) of hydrochloric acid in the reaction byproducts (see Table 2).

Project Rationale

Smoke pots similar to the M5, as well as most of the rest of the munitions shown in Table 1, have been used in training since the Second World War and all of them are being used in today's field training exercises. The table shows representative data for the HC munitions expended at Fort Irwin, California during FY82-84.

A recent study aimed at characterizing the HC smoke pot, including its reagent materials, generation process, product gases, and aerosol particles, generated the chemical data upon which this risk assessment is based.[4] The reagent material taken from smoke pots consisted of hexachloroethane (HCE), zinc oxide, and grained aluminum.

Chamber tests generating HC smoke with simulated (scaled-down) smoke pots consistently formed the gases listed in Table 2. Metals and metalloids quantified from actual HC smoke canisters are listed in Table 3. The basic chemical reaction of the HC mix is:

$$2\ Al + C_2Cl_6 + 3\ ZnO \rightarrow 3\ ZnCl_2 + Al_2O_3 + 2\ C + heat \quad \{Eq\ 1\}$$

The metal compounds identified or believed to be formed in the HC smoke emission byproduct include zinc chloride, cadmium chloride, lead chloride, arsenic (chlorides and oxides), and aluminum oxide. Tables 2 and 3 also give an upper limit estimate of the amount of each compound from 133659 kg of HC mix expended at Fort Irwin, California, during FY 82-84, assuming a 70 percent burn efficiency.

The grenades, artillery shells, and smoke pots all contain slightly different chemical mixes for producing HC smoke. These differences, coupled with variations in weather characteristics, quantities of smoke generated, orientation of the pot during ignition, and training protocol for each exposed or potentially exposed soldier in any given training exercise, assure a wide variety of exposures to the individual.

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[3] Toxicological Research Laboratories, Informal Monthly Progress Report 2 (15 June, 1944).

[4] S. Katz, A. Snelson, R. Farlow, R. Welker, and S. Mainer, Physical and Chemical Characterization of Fog Oil Smoke and Hexachloroethane Smoke--Final Report on Hexachloroethane Smoke, ADA080936 (Fort Detrick, MD, January 1980).

CHEMICAL CHARACTERIZATION OF HC SMOKE POT RESIDUE

INTRODUCTION

Background

Obscurant smokes are used by the Army during training. One of these is hexachloroethane smoke (HC-smoke), which is produced by reaction of hexachloroethane (46.7%), zinc oxide (46.7%) and granular aluminum (6.7%). The hexachloroethane and zinc oxide ratio is generally maintained close to 1:1 while the aluminum content is varied slightly to regulate the burning rate (USA 1975). Equation 1 gives the chemical reaction in smoke formation.

$$C_2Cl_6 + 3ZnO + 2Al \text{ -------> } 3ZnCl_2 + Al_2O_3 + 2C + heat \quad (Eq.\ 1)$$

The $ZnCl_2$ vapors, after rapid condensation, form the desired obscurant particulates. The vapor and particulate matter emitted by the HC smoke mixture have been chemically characterized in test burns with simulated "mini" smokepots by Katz et al. (1980). Major constituents have been monitored in field tests and their relative concentrations determined at various distances from the source (Schaeffer et al. 1986, 1987).

A health risk assessment of HC smoke found that the carcinogenic potential of the chemical by-products formed during the smoke generation process created a high excess risk to military personnel (Novak et al. 1983). The study did not consider the possible effects of residues on environmental and human health. Although the vapors and particulate matter emitted from HC smokepots have been chemically characterized, the chemical compositions of smokepot and deposited residues are unknown. As shown in this study, pot and deposited residues are each about 20 % (2000 g) of the smokepot charge (13,600 g).

The effects (if any) of residues on human health and the environment are not known. Information on the chemical composition of the residues is needed to determine the hazards associated with spent smokepots. The Army does not have a published standard operating procedure for collecting and disposing of used smokepots in an environmentally acceptable manner. Before alternative acceptable disposal measures can be employed, the smokepot residues must be chemically characterized. Based on this characterization, alternative Preventative Environmental Technology (PET) measures can be developed and tested.

Objective

A three phase study of HC smokepot residues is planned. This research will determine the need for preventative measures to avoid environmental contamination and for development of safe disposal methods for workers. Phase I, reported here, character-

R* NCI-CG-TR-
80
R* NCI-CG-TR-
,80

Results Positive:
198,80); Negative:
30) NTP Carcino-
ptember 1980.
TA.
omp it emits very

ODIOXIN mixed
AND HEPTA-
%:1.23%

I #: ML 2705000

DEN:
R* NO1-CP-12338
R* NO1-CP-12338

omp it emits very

H #: TY 1050000

DEN:
AAP 30,470,69
AAP 30,470,69

comp it emits very

DE

H #: KO 0875000

p: 230°-260° @ 8
emp.: 1148°F, vap.

ETHER HEXACHLORO

DDEN:
CYAT 2,1707,63

00 ug/m3 (SCP-I)

e closely related com-

n, dry chemical, CO_2.
lorides.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl⁻.

1,1,1,2,2,2-HEXACHLOROETHANE

CAS RN: 67721 NIOSH #: KI 4025000
mf: C_2Cl_6; mw: 236.72

Rhombic triclinic or cubic crystals, colorless, camphor-like odor. mp: 186.6° (sublimes), d: 2.091, vap. press: 1 mm @ 32.7°. Readily sublimes without melting; bp: 186.8° (triple point). Sol in alc, benzene, chloroform, ether, oils. Insol in H_2O.

SYNS:
CARBON HEXACHLORIDE
ETHANE HEXACHLORIDE
ETHYLENE HEXACHLORIDE
HEXACHLOR-AETHAN (GERMAN)
HEXACHLOROETHANE (DOT)
HEXACHLOROETHYLENE
NCI-C04604
PERCHLOROETHANE

TOXICITY DATA: 3

orl-gpg LD50:4970 mg/kg
orl-mus TDLo:230 gm/kg/-78W-I:CAR
orl-mus TD:460 gm/kg/78W-I:CAR
orl-rat LD50:6000 mg/kg
ipr-mus LD50:4500 mg/kg
ivn-dog LDLo:325 mg/kg
scu-rbt LDLo:4000 mg/kg

CODEN:
AIHAPP 40,157,79
NCITR* NCI-CG-TR-68,78
NCITR* NCI-CG-TR-68,78
NATUAS 210,744,66
ARZNAD 11,902,61
QJPPAL 7,205,34
QJPPAL 7,205,34

Carcinogenic Determination: Animal Positive IARC** 20,467,79.

TLV: Air: 10 ppm DTLVS* 4,213,80. *Toxicology Review:* AIHAAP 40,A46,79; 27ZTAP 3,76,69. OSHA Standard: Air: TWA 1 ppm (skin) (SCP-H) FEREAC 39,23540,74. DOT-ORM-A, Label: None FEREAC 41,57018,76. NCI Carcinogenesis Bioassay Completed; Results Positive: Mouse (NCITR* NCI-CG-TR-68,78); Negative: Rat (NCITR* NCI-CG-TR-68,78). Selected by NTP Carcinogenesis Bioassay as of December 1980. "NIOSH Manual of Analytical Methods" VOL 2 S10. NIOSH Current Intelligence Bulletin 27, 1978. Reported in EPA TSCA Inventory, 1980.

THR: HIGH via ivn; MOD orl; ipr, and dermal. An exper CARC. Liver injury has been described from exposure to this material. See also chlorinated hydrocarbons.

Explosion Hazard: Slight, by spont chemical reaction. Dehalogenation of this material by reaction with alkalies, metals, etc., will produce spont explosive chloroacetylenes.

Disaster Hazard: Dangerous; when heated to decomp, emits highly tox fumes of phosgene.

For further information see Vol. 2, No. 2 of *DPIM Report.*

1,2,3,4,10,10-HEXACHLORO-1,4,4a,5,8,8a-HEXAHYDRO-1,4:5,8-DIMETHANONAPHTHALENE endo,exo-, (CAST SOLID)

CAS RN: 309002 NIOSH #: IO 2150000
mf: $C_{12}H_8Cl_6$; mw: 364.90

SYN: ALDRIN, CAST SOLID (DOT)

INEEL
Idaho National Engineering & Environmental Laboratory

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: Site 045 Track 1 Decision Documentation Package, OU 10-08: Dirt Pile with Naval Smoke Cans Near INTEC (DOE/ID 10897)

DATE: April 3, 2002 **REVIEWER:** IDEQ

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
COMMENTS				
1		Last page	Handwritten note at end of package - please add author's name for tracking purposes should future questions arise.	Comment incorporated.